

Quantum Consciousness

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Abstract

Dogmaticity in the current paradigm of science (materialist science) is discussed along with the paradigm shift that is taking place to a new dogma-free science (science within consciousness). The old science subverted creative intelligence. It is shown that the new science restores it.

Keywords: Metaphysics, Cartesian philosophy, psycho-social conditioning, creativity, paradigm shifts, organismic biology, quantum measurement, science with consciousness, downward causation, subjectivity in science, purpose in science.

Modern science was created in a struggle to break away from religious (Christian) dogma¹. From the get go, it had two prongs: theory and experiment. It was believed that the idea of verifying theory with experimental data should be enough of a guarantee against dogma.

Alas! It is not so simple. First, it seemed logical that underlying worldview assumptions and ideas that cannot be subjected to experimental verification become dogma such as the religious dogma of God. So scientists tried to keep such assumptions at bay. Get real! Keep your theories to what is observable, material universe and the like. This itself, however, is a dogma: the metaphysical dogma of scientific realism as opposed to the

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metaphysics of idealism (of Plato and the founders of religious/spiritual traditions) where (unverifiable) ideas such as God are recognized as the primary reality. We should be a little humble in deciding among metaphysical alternatives. What is untractable and unquantifiable today becomes tractable tomorrow.

Second, the question of how to define the arenas of experimental data is not easy to tackle. The arenas of scientific research have a tendency to expand as measurement technology improves. But scientists battle the territorial expansion lest their previous territory loses importance in the battle for research support. On the other hand, scientists often try to narrow down the territory. Perhaps what previously seemed to be a different territory is only a mirage. This is the dogma of parsimony or Occham's razor.

Modern science grew up with the Cartesian philosophy of modernism in which two arenas—matter and mind—were recognized. This made sense since matter is experienced external to us whereas mind is internal.

Living beings are so strikingly different from inanimate matter that for a long time the arena of life was recognized as an arena of science separate from the arena of inanimate matter where perhaps vital forces (as proposed by theories subscribing to the philosophy of vitalism) play a role.

However, the discovery of fossil data suggested that living beings evolve and Darwin's theorization based entirely on material mechanisms was considered adequate for explaining evolution. This development and the discoveries of molecular biology (for example, the genetic code) were considered enough to eliminate vitalism. Similarly, advances in artificial intelligence science and cognitive psychology lead to the idea that mind is brain.

Artificial intelligence research has given us the idea of thinking machines and has produced software that can converse with you with such seeming intelligence as to fool you into believing that you are talking to another human being. Couple this with the recent development of neurophysiological imaging technique where researchers can show images of how your brain changes as you think different thoughts. So mind must be software of brain hardware.

Finally, the dogma of parsimony was helpful to eliminate the idea of mental and the vital world in favor of material monism – all is matter and space and time where matter's manifestations take place.

Together, scientific realism and material monism gave us the current metaphysical dogma of science – scientific materialism – only matter and space-time manifestations of its interactions are real. This dogma is seen as a great triumph, a unifier of disparate fields of physics and chemistry, biology, psychology, and medicine into one grand materialist science, a theory of everything.

As stated before science began as modernist science within the worldview/dogma of matter-mind dualism in which science (for which the arena of the play is space-time-matter world) and humanities and the arts, and religion/spirituality (for which the play takes place in the arena of the mind) all can coexist. But it has ended up as a postmodern science in which matter is the only reality and nature consists of the arena of movement of matter – space and time. All else is supernatural, unscientific, and suspect.

The advent of the new dogma of scientific materialism has not only put religion/spirituality under attack but also endangered the free pursuit of any human endeavor unless it conforms to this dogma. Thus in the academe, traditional liberal arts fields are shrinking and the social sciences are scrambling to bring themselves at par with the materialist dogma.

In particular, the materialist dogma--everything is matter, and its dogmatic offshoots--all traits are genetic, everything experienced internally is brain product, evolution is synonymous with Darwinism, there is nothing to our self than genetic and psycho-social conditioning, and that our consciousness itself is an operational appendage without any causal power or efficacy--is taught pretty early on in our schools, some of it directly and some of it indirectly. As a result, today's young people contract permanent cognitive dissonance--a permanent lack of synchrony between their experience and their belief system through which they sift their experience.

What is the antidote to dogma, dogmatic thinking? It is creativity: creative thinking that we use to discover new contexts of thinking that lie beyond the rational and continuous mind which is mapped

into the brain and in some sense *is* the brain. The materialist dogma limits the scope of the human mind that is beyond rational thinking, beyond what is already known and mapped in the brain; it limits creative intelligence.

Before modern science, when we had Christianity dominating the Western mind, the scriptures were infallible and any change depended on the whim of the Church hierarchy (the interpreters of the scriptures). Creativity became so constrained that we had the long stagnancy of the medieval ages. And now with materialist science, we are in a similar, nay perhaps even bigger danger.

The new contexts that creative discoveries give us (that are often the subject of the great arts for example) are not always observable in the objective experimental sense that material stuff is observable. Nor can they always be figured out rationally. So materialist scientists fight the relevance of the idea of creativity in science; instead they tend to maintain the façade that science is done via the scientific method – theorize a possible explanation of the data; derive an independent consequence of the theory and subject that to verification; if the theory works, you’ve got it; otherwise go back to the drawing board. The scientific method can easily get by with continuous thinking so creative thought and the unobservable contexts they point to (that are explored in the great arts or the great religions) need not be taken seriously. This is the dogma of scientific method and rationalism. With this dogma, one can keep creativity at bay and perpetuate the dogma. Or so one hopes.

Are dogmas inevitable or is there a dogma-free science? I will demonstrate that there is. This much is also clear. If science has to be dogma-free, then the correct science has to be one in which creativity is a fundamental element.

And such a science would validate all creative human thought. And this is exactly what is happening.

Paradigms and Paradigm Shifts

The philosopher Thomas Kuhn gave us the idea of paradigm. A paradigm in a field is a model that gives a worldview umbrella to all research in that field. Kuhn also gave us the idea of a paradigm shift. With the advent of new data, new theories are needed to explain the data. The new theories may show logical inconsistencies

or paradoxes when looked upon from the perspective of the old worldview assumptions. Additionally, there may be anomalous data for which no theory can be constructed while staying within the old worldview assumptions. This is when a paradigm shift must take place to a new paradigm with new worldview assumptions that eliminates the logical paradoxes and that explains the anomalous data.

As I stated above, materialist science that operates under the worldview umbrella of scientific materialism claims to have unified all sciences—physics and chemistry, biology, medicine, and psychology. There is enormous academic pressure that all research in these sciences is carried out under the one worldview assumption of scientific materialism. As I mentioned above even the social sciences are under pressure to conform.

This unification, however, has not entirely followed the Kuhnian script. The unification has been achieved by leaving out major data, sometimes entire phenomena. (Ironically, the spiritual/religious worldview that modern science replaced made the same mistake; it left out any phenomena that did not fit. In its extreme form, it ignored the entire manifest world as illusory because the worldview could not explain it.)

Naturally, there is resistance against this monolithic approach to science. The cultural anthropologists have developed the concept of multiculturalism as a way of escaping the tyranny of one monolithic materialist science. The field of psychology is divided into four paradigms: behavioral/cognitive that dominate academia, depth psychology, humanistic psychology, and transpersonal psychology. Only the first conforms to scientific materialism; the other three come with separate worldview assumptions. Depth psychology posits the concept of the unconscious as a source of cause other than material interactions. Humanistic psychology is adamant upon the causal efficacy of human free will and creativity. And transpersonal psychology operates on the basis of an entirely different worldview (called monistic idealism) that consciousness, not matter, is the ground of all being. And all three forces of alternative psychology insist that psychology cannot be reduced to neurophysiology; the psyche is an independent arena for the play of reality.

The field of medicine is similarly divided between conventional modern medicine or allopathy and various paradigms of alternative medicine. Only the conventional modern medicine is included in materialist science. All the alternative medicine paradigms have good data behind them; all the paradigms have useful applications. But they are based on entirely different worldview assumptions from materialist science. For example, the traditions of Indian Ayurveda, Traditional Chinese medicine (of which acupuncture is a component), and homeopathy, all posit that vital energies of movement in the vital world are often a fundamental aspect of disease and healing.

It seems that a forced unification under the one paradigmatic umbrella of materialist science is premature. There are tentative ideas of evidence-based psychology and evidence-based medicine. But these are only stop-gap measures.

In truth, there are dissonant voices even within biology—organismic biology. The phenomenon of development—how an one-celled embryo develops into an adult organism with differentiated organs seems to be beyond the purview of a materialist biology (Goodwin, 1994). An alternative source of causation other than material interactions seems needed at the level of the organism. There is also the remarkable alternative modus of evolution called Lamarckism which works through the inheritance of acquired characteristics and which also seems to need alternative nonmaterial power of causation (Cairns et al, 1988).

The plot has thickened. The biologist Rupert Sheldrake (1981) has noted that an essential aspect of cell differentiation, namely, how a cell knows where it is in the body in order to differentiate properly, cannot be explained by material interactions which are local affecting only that which is in the vicinity. Sheldrake posited nonmaterial morphogenetic fields as the causal source of cell differentiation. It is just one more step to identify vital energy of alternative medicine traditions as the movement of morphogenetic fields giving validity to their worldview that posits a vital world.

In the same vein, the philosopher John Searle (1994) and the physicist/mathematician Roger Penrose (1991) have pointed out that a thought is more than just content, it also has meaning. And they have proven that computers—symbol processing machines-

-can never process meaning. So a mental world is needed for the play of meaning.

So what gives? The materialist paradigm of science must be incomplete if it cannot unify these legitimate paradigmatic pursuits in psychology and medicine. Should we give up then the search of one unifying paradigm? No. There is only one reality and it makes sense there should be only one set of worldview assumptions that should fit all phenomena – whatever that is the case.

As mentioned earlier, in his research Kuhn made a very important observation: if a paradigm is incomplete, the incompleteness is bound to show up in two different ways. First, there must develop logical paradoxes within its own theories that cannot be resolved while keeping within the worldview assumptions of the paradigm. Second, there would be anomalous data that any extension of the paradigm will be unable to explain even in principle. This is exactly what is happening right now.

Today, physicists universally agree that quantum physics, discovered in mathematical form in 1925-26 by Werner Heisenberg and Erwin Schrodinger, is the final paradigm of physics. However, there is a fundamental difficulty in its interpretation, an unsolvable paradox called the quantum measurement paradox, if we keep to the worldview assumption of scientific materialism. The resolution of this paradox is leading us to a new science that seems to satisfy all the criteria needed for the new paradigm: it resolves paradoxes of the old science and explains anomalous data; it unifies the alternative forces of biology, psychology, and medicine, and, most importantly, it fundamentally incorporates the phenomenon of creativity.

The Paradox of Quantum Measurement

Like most of physics, quantum physics is mathematical and this scares nonscientists to some extent. Actually though, the interpretation question only needs talking *about* mathematics, no more than that. So relax.

Quantum physics is the physics of possibilities – objects are depicted as (many faceted) possibilities, waves of possibility. Yet when we measure, we find actuality, particles manifest at a specific place. How does a many-faceted possibility packet collapse to one-

faceted actuality simply as a result of our observation? Trying to answer this question staying within scientific materialism gives us a paradox – quantum measurement paradox.

Scientific materialism's success (limited as it maybe) is due largely to the applicability of a doctrine called reductionism in the material domain – the macro of the material world can be reduced to the micro. Accordingly, the very successful picture we have of the material world is this: elementary particles at the base level make conglomerates called atoms; atoms make molecules; molecules make cells; cells make organs like the brain; and brain makes the conscious observers – us. However, in quantum physics, micro objects consists of possibilities and the macro they make up also consists of possibilities.

So here is what is paradoxical: how can a possible brain (a possible observer) look at a possible elementary particle and make actuality? Think about it; it can't.

The mathematician John von Neumann (1955) made this into a rigorous mathematical theorem: material interaction can only convert quantum possibilities into other quantum possibility, never actuality.

But of course, measurement does produce actuality a fact that is often called the observer effect. So von Neumann suggested that an observer's consciousness must be a nonmaterial dual entity. But dualism is not scientific. How does a nonmaterial consciousness interact with matter in order to collapse its possibility packet into actuality? Scientifically speaking, this requires the exchange of a signal. Signals carry energy. But the energy of the material universe alone is always a constant; none of it leaks to the dual world of consciousness!

The Solution and the birth of a New Science: Science within Consciousness

The situation above was a standstill for many decades until the breakthrough idea came that if the quantum possibilities of matter are possibilities of consciousness looked upon as the ground of all being, then collapse of possibility into actuality can be seen as the result of conscious choice of one facet from the multifaceted possibility object. And since consciousness is choosing from itself,

no interaction is needed, the paradox of dualism is also avoided (Goswami, 1989, 1991, 1993).

Behold! This is a radically new worldview. True that in its essence it is the same metaphysics of monistic idealism—consciousness is the ground of all being—that is the basis of all spiritual traditions and that is also adapted in transpersonal psychology. But its radicalness lies in the additional detail. We have always suspected that there is causal efficacy in the world over and above the material interactions. Spiritual traditions call it downward causation; humanists call it free will. But for the first time in human history we now know what the causal efficacy of downward causation or free will consists of: conscious choice of actuality from quantum possibility.

Can a new integrative science be built on this new metaphysics? Yes. We will call this Science within consciousness.

The Source of Downward Causation: quantum Consciousness

Identifying downward causation with free will—our freedom to choose can be confusing creating such slogan as “we create our own reality.” Who creates? Some clarification is needed. Is this provided through the resolution of a second paradoxical aspect of quantum measurement called the paradox of Wigner’s friend. Imagine that Wigner, the Nobel laureate physicist who thought of the paradox, is approaching a quantum traffic light with two possibilities, red and green; at the same time his friend is approaching the same light from the perpendicular road. Being busy people, they both choose green. Unfortunately, their choices are contradictory; if both choices materialize at the same time, there would be pandemonium. Obviously, only one of their choices counts, but whose?

In the context of how we ordinarily experience our consciousness, there is only one solution. Wigner knows that he is conscious; for example, he is aware that he is aware. However, he can only ascertain this for himself, never for his friend or any other person. In this way, if he now assumes that he is the only person with consciousness, then only he gets to be the chooser and the paradox is solved. This philosophy is called solipsism, but Wigner could not be happy with it. He found it disturbing that his friend would

have to stay in a state of suspended possibility until Wigner looks at him!

The solution to the paradox is this (Bass (1971); Goswami, 1989, 1993); Blood (1993, 2001): consciousness is one, nonlocal and cosmic, an interconnectedness behind the two people's local individuality. Wigner and his friend both choose but only figuratively speaking, the one consciousness chooses for both of them avoiding any contradiction. This allows the result dictated by quantum probability calculations that in many such crossings, Wigner and his friend each would get green light fifty percent of the time; yet for any individual crossing, a creative opportunity for getting green is left open for each.

Notice that we regain objectivity. The source of downward causation, call it quantum consciousness, being universal, is objective. You can call it God to connect with spiritual traditions' concept of downward causation, but now God is scientific, it is quantum consciousness. And quantum consciousness's choice for many people and many events is also objective, being in accordance with quantum physics's probability calculations. So physics and chemistry, indeed any science of nonliving objects, are safe from any revision for all practical purposes.

Including Subjectivity in Science

One of the glaring shortcomings of materialist science is its inability to explain experience which as a subjective as well as an objective component. If you begin with objects and their interactions, all you end up with is more object, never a subject. The philosopher David Chalmers has called this the hard question of neurophysiology. One of the triumphs of the new science is that the subject and the subjective can be included within science.

There is one more paradox connected with quantum measurement the solution of which shows us how one undivided consciousness splits as a subject and an object in a quantum measurement. You may not have noticed, but there is another way that we can see a paradox in the observer effect. The observer chooses out of the quantum possibilities presented by the object the actual event of experience. But before the collapse of the possibilities, the observer himself (or herself) consists of possibilities and is not manifest. So we can posit the paradox as a circularity: observer is needed for

collapsing the quantum possibility wave of an object; but collapse is needed for manifesting the observer. More succinctly speaking: no collapse without an observer; but no observer without a collapse.

If we stay in one level, the material level, there is no solution to the paradox. The consciousness solution works only because we posit that consciousness collapses the possibility waves of both observer (his/her brain) and the object from the transcendent reality of the ground of being that consciousness represents.

The artificial intelligence researcher Douglas Hofstadter (1980) gave us the clue for understanding what is going on. Such circularities as above, he noted, are called tangled hierarchies, and most interestingly, self-reference, a subject-object split, emerges from such circularities.

To clarify, let's consider an example given by Hofstadter. Consider the Liar's paradox expressed in the sentence, I am a liar. Notice the circularity: if I am a liar, then I am telling the truth; if I am telling the truth, then I am lying, ad infinitum. But this infinite oscillations has made the sentence very special--the sentence is speaking of itself, separate from the rest of the world of discourse.

But this apparent separation of the self of the sentence and its world, in other words the sentence's apparent self-reference, depends on our understanding and staying within the rules of the English grammar. The circularity of the sentence disappears for a child who will ask the speaker of the sentence, Why are you a liar? But grammar, although the real cause, is implicit, transcending the sentence.

Similarly, in the observer effect, the reason it took us physicists a while to decipher the situation, the choosing quantum consciousness is implicit, not explicit, transcendent, not immanent. The collapse is tangled hierarchical giving the appearance of self-reference, the subject-object split. The observer-I, the apparent subject of the collapse arises co-dependently with the object because consciousness identifies with the brain part of the objects collapsed (Goswami, 1989, 1993).

There is something special about the brain. To see this, consider a Geiger counter which is called a "measurement apparatus," but in truth is only useful for amplification of the signal. A Geiger counter

is simple hierarchical; what is signal (the micro) and what is the amplifier (the macro) that is affected by the signal is clear; thus they form a simple hierarchy of cause and effect. But in a self-referential system such as the brain, there is feedback and the causal levels involved in the transition from micro to macro get infinitely mixed up forming a tangled hierarchy.

Whenever there is a collapse of a quantum possibility wave, there is a tangled hierarchy in its measurement. But notice that the existence of the tangled hierarchy depends crucially on the micro-making up-macro aspect of matter. And thus quantum collapse can take place only when matter comes into play.

Three comments. First, about the unconscious of Freudian vintage. Materialist science denies the existence of it because in that science it is impossible to distinguish between conscious and the unconscious. But there is now much evidence for the unconscious and it is now widely recognized that unconscious processing is the crucially important second stage of the creative process consisting of preparation, incubation, sudden insight, and manifestation (Goswami, 1999). In the new science, the tangled hierarchical collapse produces subject-object split awareness. When there is no collapse, there is no awareness either and this state of one undivided unmanifest consciousness is the unconscious. To be sure, the Freudian unconscious is only a limited subset of this. In truth, the concept of the unconscious that quantum physics is giving us is even more general than Jung's concept of the collective unconscious.

Second, for an unlearned stimulus, the choice in a quantum measurement is free, and the self of self-reference is cosmic, nonlocal. Call it the quantum self and its experience is called superconscious in psychology. However, the measurement makes a memory of the response. Thus for repeated encounters with a stimulus that happen when we learn it, the feedback from memory is able to limit the choice in favor of past responses. In this way, the self acquires conditioning (Mitchell and Goswami, 1992). This is the origin of the ego.

Third, there is no need to posit that tangled hierarchical quantum measurement can happen only in the brain. The concept of tangled hierarchical self-reference allows us to distinguish life and non-life

and opens us to a concrete definition of life if we recognize that the living cell is also a tangled hierarchical system. In fact, this is easy enough to see: just notice the causal circularity that exist between the two important macromolecules of the living cell: DNA and protein. DNA is needed to provide the genetic code to make protein from the amino acids; but protein is needed to make DNA (Goswami, 2008a).

Including the Whole Human Experience in Science

As matter loses its scientific supremacy in the new science, no longer is it necessary to exclude any part of the human experience. As the psychologist Carl Jung (1971) codified, we have four kinds of experiences: sensing, feeling, thinking, and intuiting. Therefore, we posit that there are four compartments, four different worlds of quantum possibilities in consciousness to choose from: physical (from which consciousness chooses sensory experiences); vital (whose energies of movement we feel); the mental (from which we choose our thoughts which are movements of meaning); and the supramental (choosing from which we intuit the archetypes such as love). These worlds have no direct interaction via local signals. Consciousness nonlocally mediates their interaction via simultaneous choice of correlated experiences.

Why do we experience the physical as external experiences and the other worlds as internal? The physical is experienced as external and gross because of the micro-macro constitution of matter. At the macro level, matter loses much of its quantum movement and acquires approximate fixity; it becomes gross. Not a bad thing because that is exactly what we need for a) giving us a reference point and b) to allow consciousness to use matter to make representations of the subtle. However, the vital-mental-supramental trio does not have any micro-macro division. In this way quantum movement persists in all these worlds. In other words, the possibility waves of the objects of these worlds change too fast to allow you and me to collapse the same thought or the same feeling or the same intuition at the same time. So we each will ordinarily experience thoughts, feelings and intuitions as private, not publicly shareable, and thus internal and subtle.

The new science in this way validates the internal experiences and room is made to reintegrate those sciences (namely alternative

medicine and alternate forces of psychology) that give importance to internal experiences with their conventional materialist counterparts. This has been discussed elsewhere (Goswami, 2004, 2008b, and to be published).

Is the New Science Dogma-free?

The dogma of materialist science – matter is everything – got its footing because we never thought that metaphysical assumptions are verifiable. With quantum physics, we find it otherwise: metaphysics is experimentally accessible and verifiable.

The causation by quantum consciousness – downward causation – have two properties: nonlocality – signalless communication via the interconnectivity of nonlocal quantum consciousness, and discontinuity – movement without going through intermediate steps. Nonlocality I have already spoken about; the second, discontinuity needs additional elaboration.

As Heisenberg first realized the quantum possibility waves – quantum potentia – reside outside of space time. How can you conceptualize “outside” space and time? Clearly it cannot be continuously outside in which case we could always include it within space and time. So “outside” must mean discontinuously outside. Another concept is transcendence. Quantum collapse that converts the transcendent possibility waves into immanent particles in space and time must therefore also be discontinuous.

A simple to visualize example of discontinuity is the quantum leap. When an electron jumps from one atomic orbit to another, it does so without going through the intervening space. This is called a quantum leap.

What is interesting is the contrast with material interactions – upward causation. Material interactions are local and continuous; they can never simulate nonlocality or discontinuity. In this way metaphysics becomes experimentally discernible. All we need to do is to demonstrate nonlocality and discontinuity. Such demonstrations are now manifold: mental telepathy and distant viewing, distant healing, transferred potential, autoscopic visions in near death experiences--all amply prove nonlocality (for a review of the data, see Goswami, 2008a). Discontinuous movements show up in the phenomenon of creativity – the creative aha! experience

in which the aha! surprise is the tell-tale sign of discontinuity. Even objective data of quantum leaps of creativity is available in the phenomenon of quantum healing – spontaneous healing without medical intervention (Chopra, 1990).

Creativity: The Centerpiece of the New Science

Another way to see that the new science is dogma-free is that creativity is included in it from the get go. The freedom of choice of downward causation is creative freedom. In a creative experience, we quantum leap from our ordinary ego-consciousness to the superconscious state of the nonlocal quantum self. Thus discontinuity and nonlocality are available for our personal verification avoiding all possibility of dogma. Just engage creativity with the objective of discovering the nature of the self for yourself.

I spoke of unconscious processing before – the incubation stage of the creative process. Possibility waves of the mind proliferate when we are not collapsing them into actualized thoughts. Unconscious processing is quantum processing – the capacity to process many possibilities at once. It is much more efficient than the step-by-step scientific method. And this is why we use creativity not only in the arts, but also in science and also for spiritual explorations of enlightenment (Goswami, 1999). And this is why creative intelligence is what we covet most; without it we would not have the great arts, the great sciences, and the great traditions of religions.

Restoring purpose in Science

One of the casualties of a physics-based materialist science is purpose. Looking at the physical universe, it is indeed hard to see any role for purpose. There is only one piece of data – the fine tuning of the universe – which has been explained with a purposive anthropic principle (universe evolves to make consciousness possible).

However, when we look at biology and biological evolution, purposiveness is obvious. For example, in the evolutionary fossil records, there is clear progression, a one-wayness, from simple fossils to complex fossils, that is suggestive of purposiveness.

But biologists today, almost as a group, consider Darwinism as synonymous with evolutionism and in Darwinism there is no

role for purpose; Darwinism considers evolution as only a play of chance and necessity: chance variation in the hereditary genes and survival necessity of the organisms which is the criterion for natural selection from among the variations. But unfortunately for materialist biologists and their dogmatic faith in Darwinism, Darwinism runs against empirical evidence of the fossil data. I have already mentioned the simple to complex one-wayness of the fossil data; this Darwinism cannot explain. And then there are the famous fossil gaps in macroevolution suggesting discontinuous epochs of evolution (Eldredge and Gould, 1972). Darwinian evolution is slow and continuous and has no credible explanation for the fossil gaps (a few intermediates do not validate Darwinism which literally requires thousands upon thousands of intermediates to fill up the fossil gaps).

When we reformulate biology as a science within consciousness, we explain the fossil gaps as the result of discontinuous quantum leaps of biological creativity (Goswami, 2008b). Since creativity is purposive, evolution in the new science is seen as purposive. The purpose of evolution is to produce better and better representations of the subtle onto the physical.

Conclusion

The message of the new paradigm of science—science within consciousness—is clear: the age of metaphysical dogma, scientific or religious, is over. Dogmas are not needed for the scientific exploration of the world. As it is for the world, so it is for us individually. We do not need dogmas to live by—other people’s belief systems. What we need is an emphasis on creative intelligence in addition to the usual emphasis on IQ rational intelligence. We need educators to adapt education to this revolutionary message of the new science.

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